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08/807.737	02/27/97	OHTANI	H 0756-1638

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EXAMINER	
SULSKY.M	
ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 02/24/99

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

Office Action Summary

Application No.

08/807,737

Applicant(s)

Ohtani et al.

Examiner

Martin Sulsky

Group Art Unit

2813

☒ Responsive to communication(s) filed on Jan 4, 1999.☒ This action is **FINAL**.☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims☒ Claim(s) 19-47 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.☒ Claim(s) 19-47 is/are rejected.☐ Claim(s) _____ is/are objected to.☐ Claims _____ are subject to restriction or election requirement.**Application Papers**☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.☐ The drawing(s) filed on _____ is/are objected to by the Examiner.☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.☐ The specification is objected to by the Examiner.☐ The oath or declaration is objected to by the Examiner.**Priority under 35 U.S.C. § 119**☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been☒ received.☐ received in Application No. (Series Code/Serial Number) _____.☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).**Attachment(s)**☒ Notice of References Cited, PTO-892☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 18☐ Interview Summary, PTO-413☐ Notice of Draftsperson's Patent Drawing Review, PTO-948☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Art Unit: 2813

DETAILED ACTION

Priority

1. Examiner acknowledges receipt of translation of the foreign priority document application JP 6-051237, now patent JP 7-235492.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 29-32,36-39,42,43,46,47 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: deposition of a silicon nitride layer in contact with the semiconductor layer. Pages 2 and 3 of the specification explicitly states that crystallizing amorphous silicon in contact with silicon oxide results in a film with a (111) orientation. The specification teaches that the amorphous film must be in contact with a silicon nitride compound. Incorporating the limitation of claim 33 into independent claims 29 and 36 would overcome this rejection.

Art Unit: 2813

5. Claims 36-39,43,47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 36-39,43,47 recite the limitation "said selected portion" in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Translation of priority document submitted. Previous rejection withdrawn.

9. Claims 29,30,33,35,36,38,39,42,43,46,47 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang ('772).

Zhang discloses a method of manufacturing a semiconductor device which comprises depositing amorphous silicon, 200-3000 Å, on an insulating substrate (col 12, lines 12-19), depositing a nickel catalyst film in contact with said amorphous layer, including an embodiment with selective deposition and lateral crystal growth (embodiment 4, figures 7A-7E), an embodiment with a silicon nitride coating layer while crystallizing (col 8, lines 11-15, embodiment 5), heated to crystallize said amorphous silicon (col 17, lines 58-60), improving the crystallinity by irradiating with visible or near infra-red light and patterning the crystallized silicon layer to form the active region of a TFT (col 17, lines 65-68).

Art Unit: 2813

As explicitly taught in pages 2 and 3 of the specification of the instant application and further acknowledged in applicants response in paper number 20, crystallizing amorphous silicon in contact with silicon nitride inherently causes crystallization in a non (111) orientation. Also, It is held, absent evidence to the contrary, that radiation in the visible to near infrared region in inherently encompasses wavelengths from .6 to 4 μm . See In re Swinhart, 169 USPQ 226,229 (CCPA 1971) (where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that subject matter shown to be in the prior art does not possess the characteristics relied on) and In re Fitzgerald, 205 USPQ 594 (CCPA 1980) (the burden of proof can be shifted to the applicant to show that subject matter of the prior art does not possess the characteristic relied on whether the rejection is based on inherency under 35 USC 102 or obviousness under 35 USC 103).

Claim Rejections - 35 USC § 103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
11. Claims 29-39,42,43,46,47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US '772).

Art Unit: 2813

Zhang teaches all of the limitations discussed in paragraph 4 above. However, the reference does not disclose the use of a halogen lamp to generate said visible or infrared light or a heating rate of 50 to 200 °C/s.

The examiner takes official notice that use of halogen lamps to generate visible and infrared light was well known in the art at the time of the invention and that this feature is disclosed in the prior art of record (US '846). While the '772 reference is silent as to the heating rate, the specification of the instant application does not disclose any criticality associated with the claimed rate. The selection of heating rate is therefore a matter of routine optimization. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

12. Claims 19-28,40,41,44,45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (US '327) or Takayama (US '225) or Yamazaki (US '698).

Art Unit: 2813

The references disclose methods of manufacturing a semiconductor device which comprise depositing amorphous silicon, 500-1500 Å, on an insulating substrate (Embodiment 1 all three references), disposing a solution containing a nickel catalyst in contact with said amorphous silicon (US '327 embodiment 4, US '225 Example 6, US '698 Example 4) including selective depositing of catalyst with lateral crystallization (US '327 col 8, lines 8-13, US '225 Figure 9A, US '698 col 12, lines 1-17), heating said amorphous silicon to crystallize (US '327 embodiment 4, US '225 embodiment 6, US '698 Example 4), irradiating with infrared light to improve crystallinity (US '327 col 6, lines 50-53, US '225 col 12, lines 46-49, US '698 col 10, lines 13-18) and patterning to form the active region of a TFT (US '327 embodiment 4, US '225 Example 6, US '698 Example 4). However, the references do not disclose the use of a halogen lamp to generate said visible or infrared light or a heating rate of 50 to 200 °C/s.

The examiner takes official notice that use of halogen lamps to generate visible and infrared light was well known in the art at the time of the invention and that this feature is disclosed in the prior art of record (US '846). While the references are silent as to the heating rate, the specification of the instant application does not disclose any criticality associated with the claimed rate. The selection of heating rate is therefore a matter of routine optimization. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they

Art Unit: 2813

produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

Double Patenting

13. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

14. Claims 19-47 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-26 of U.S. Patent No. 5605846. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the reasons of record in paragraph 8 of paper number 16 and the following reasons.

As explicitly taught in pages 2 and 3 of the specification of the instant application and further acknowledged in applicants response in paper number 20, crystallizing amorphous silicon in contact with silicon nitride inherently causes crystallization in a non (111) orientation. The only new limitation in the instant application is the heating rate which obvious for the reasons discussed in paragraph 11 above.

Art Unit: 2813

Response to Arguments

15. Applicant's arguments with respect to claim 19-33 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

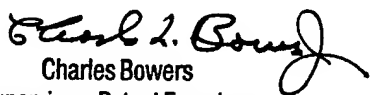
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication from the examiner should be directed to Martin Sulsky whose telephone number is (703) 305-0129. The examiner can normally be reached by telephone on Monday to Thursday 6:30 AM to 5:00 PM.

Art Unit: 2813

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Bowers, can be reached on (703) 308-2417. The fax phone number for the group is (703) 305-3432.

MS


Charles Bowers
Supervisory Patent Examiner
Technology Center 2800

February 18, 1999